Small Business Innovation Research/Small Business Tech Transfer

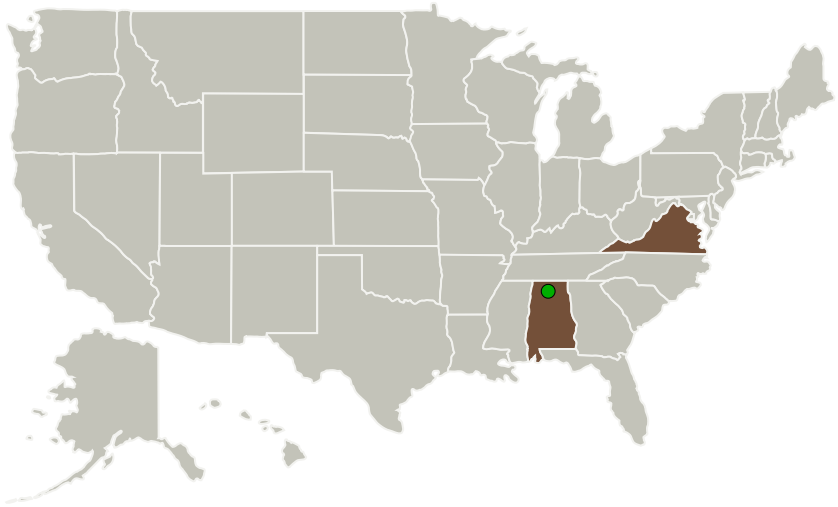
1U CubeSat Lasercom Terminal for Deep Space Communication, Phase II

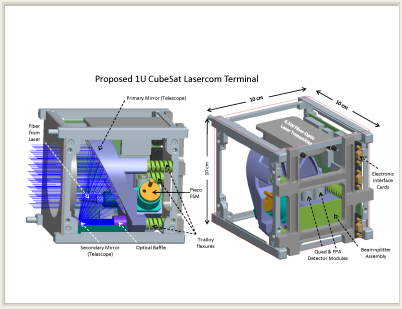
Completed Technology Project (2015 - 2018)

Project Introduction

In this NASA SBIR-select Phase 2 program Fibertek will develop, test and validate a high-fidelity 1U CubeSat Lasercom Optical Terminal prototype, optimized for deep-space optical communication, and targeting the following characteristics – (i) Low Size/Weight/Power (SWaP) 1U Lasercom Terminal for deep-space mission (total power budget P<10W is targeted), (ii) Athermalized optical design of a fiber-coupled laser transmitter to innovative optical telescope for lasercom transmit/receive function, (iii) quasi-monolithic design and fabrication of the optical assembly with large 65 mm aperture, (iv) integrated beam point-ahead and beam-pointing stabilization capability, (v) integrated radiation-tolerant controller card for all control and interface functions for this 1U CubeSat terminal, (vi) Low power radiation-tolerant FPGA based electronics design, for a reconfigurable and highly capable processing platform, and (vii) compatible with a CubeSat bus interface with the appropriate ADCS system. The prototype optical terminal will be tested and characterized in a lab environment, for optical signal sensitivity levels, acquisition field-of-view requirements, and very low jitter pointing stabilization, representative of the requirements for deep-space optical communication link.

Primary U.S. Work Locations and Key Partners





1U CubeSat Lasercom Terminal for Deep Space Communication, Phase II Briefing Chart Image

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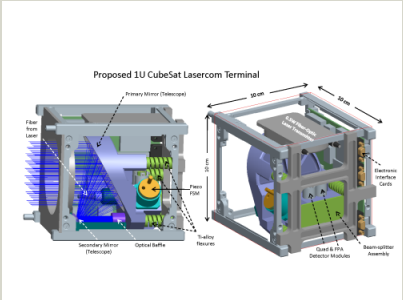
Organizations Performing Work	Role	Type	Location
Fibertek, Inc.	Lead Organization	Industry	Herndon, Virginia
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	Virginia

Images



Briefing Chart Image
1U CubeSat Lasercom Terminal for Deep Space Communication, Phase II Briefing Chart Image *(https://techport.nasa.gov/image/129766)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Fibertek, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

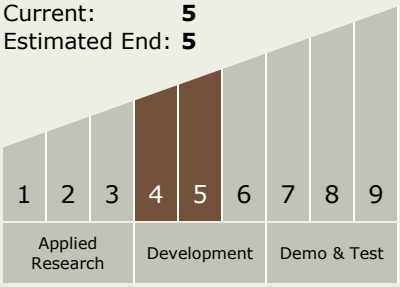
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Michael Albert

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.1 Optical Communications
    - TX05.1.4 Pointing, Acquisition and Tracking (PAT)

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System